

In the Claims

Claim 1 (currently amended): A method of forming a material over a substrate comprising utilization of at least one iteration an ALD-type pulse sequence of M_1 - M_2 -R, where M_1 is a first metal-containing precursor comprising a first metal, M_2 is a second metal-containing precursor comprising a second metal different from the first metal, and R is a reactant which reacts with one or both of the first and second metals; wherein one of the first and second metals is hafnium and another of the first and second metals is aluminum; wherein one of the first and second metal-containing precursors comprises one or both of tetrakis-methylethylamido hafnium (TMEAH) and tetrakis-dimethylamino hafnium (TDMAH); and wherein another of the first and second metal-containing precursors comprises trimethyl aluminum (TMA).

Claims 2-9 (canceled).

Claim 10 (withdrawn): The method of claim 1 wherein:

the first metal is hafnium,

the second metal is aluminum,

M_1 is tetrakis-methylethylamido hafnium (TMEAH), and

M_2 is trimethyl aluminum (TMA).

Claim 11 (withdrawn): The method of claim 1 wherein:

the first metal is hafnium,

the second metal is aluminum,

M₁ is tetrakis-dimethylamino hafnium (TDMAH), and
M₂ is trimethyl aluminum (TMA).

Claim 12 (original): The method of claim 1 wherein:

the first metal is aluminum,
the second metal is hafnium,
M₁ is trimethyl aluminum (TMA), and
M₂ is tetrakis-methylethylamido hafnium (TMEAH).

Claim 13 (original): The method of claim 1 wherein:

the first metal is aluminum,
the second metal is hafnium,
M₁ is trimethyl aluminum (TMA), and
M₂ is tetrakis-dimethylamino hafnium (TDMAH).

Claim 14 (original): The method of claim 1 wherein:

the first metal is aluminum,
the second metal is hafnium,
R is ozone (O₃),
M₁ is trimethyl aluminum (TMA),
M₂ is tetrakis-methylethylamido hafnium (TMEAH), and
and the pulse sequence is TMA-(TMEAH-O₃)_x, where x is an integer greater than zero.

Claim 15 (original): The method of claim 1 wherein:

the first metal is aluminum,

the second metal is hafnium,

R is ozone (O_3),

M_1 is trimethyl aluminum (TMA),

M_2 is tetrakis-dimethylamino hafnium (TDMAH), and

and the pulse sequence is TMA-(TDMAH- O_3) x , where x is an integer greater than zero.

Claims 16-19 (canceled).

Claim 20 (currently amended): A method of forming a material over a substrate, comprising:

placing the substrate within a reaction chamber and, while the substrate is within the chamber, performing at least one iteration of the following sequence:

providing a first precursor within the reaction chamber and chemisorbing a first species from the first precursor onto the substrate;

removing substantially all of the first precursor from within the reaction chamber;

providing a second precursor within the reaction chamber and sorbing a second species from the second precursor in contact with

the first species, the second precursor having a different composition than the first precursor; wherein one of the first and second species comprises hafnium and the other of the first and second species comprises aluminum; wherein one of the first and second precursors comprises one or both of tetrakis-methylethylamido hafnium (TMEAH) and tetrakis-dimethylamino hafnium (TDMAH); and wherein another of the first and second precursors comprises trimethyl aluminum (TMA);

removing substantially all of the second precursor from within the reaction chamber;

providing a reactant within the reaction chamber and reacting said reactant with at least one of the first and second species; and

removing substantially all of the reactant from within the reaction chamber.

Claims 21-27 (canceled).

Claim 28 (currently amended): The method of claim 20 wherein the first precursor is trimethyl aluminum and the second precursor is ~~tetrakis-methylethylamido~~ tetrakis-methylethylamido hafnium.

Claims 29 and 30 (canceled).

Claim 31 (withdrawn): The method of claim 28 wherein the first species comprises aluminum, the second species comprises hafnium, the reactant comprises nitrogen, and the reacting forms aluminum nitride and hafnium nitride.

Claim 32 (canceled).

Claim 33 (withdrawn): The method of claim 28 wherein the first species comprises aluminum, the second species comprises hafnium, the reactant comprises silicon, and the reacting forms aluminum silicide and hafnium silicide.

Claims 34-86 (canceled).